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SASKATCHEWAN INSTITUTE OF PEDOLOGY

GEOLOGY OF THE OUTLOOK IRRIGATION PROJECT

Report 0117-001 November 23, 1987

E. A. Christiansen Consulting Ltd.

E. A. Christiansen Consulting Ltd.

CONSULTING GEOLOGIST

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November 23, 1987

Saskatchewan Institute of Pedology
University of Saskatchewan
Saskatoon, Saskatchewan
S7N OWO

Attention: Dr. J.L. Henry

Dear Dr. Henry:

Enclosed are ten copies of Report 0117-001 on the "Geology of the Outlook Irrigation Project". The report includes two maps (Drawings 0117-001-01,02), ten cross sections (Drawings 0117-001-03 to 12), five figures depicting the origin of the surficial stratified drift, an index of logs and wells, geological logs of testholes drilled during the study, and carbonate and mechanical analyses.

Aquifers occur in the Judith River and Bearpaw formations; in the Empress Group, particularly in the Conquest, Outlook, and Tyner valleys; and in surficial sands and gravels. Although intertill aquifers are not shown in the cross sections, they are known to occur locally.

Aquifers in the Judith River Formation in the Outlook irrigation project have heads below surface and, consequently, do not contribute to water logging and soil salinity. Aquifers in the Bearpaw Formation are known to contribute to soil salinity, particularly where they encounter till fills in the Conquest and Outlook valleys south of Outlook and in the lowlands north of Hawarden Hills upland.

Aquifers occur sporadically in blankets of sands and gravels in the Empress Group lying between till and bedrock and in wedges of sands and gravels in the Conquest, Outlook, and Tyner valleys. The Empress Group in the preglacial Outlook and Tyner valleys are composed of well rounded quartzite and chert gravels which are not present in the Empress Group in the glacial Conquest valley. Both the preglacial Outlook Valley and the glacial Conquest Valley (Drawings 0117-001-09, Testholes 167,326) are superposed south of Outlook forming a complex aquifer system in these reaches of the valleys.

Surficial sand and gravel aquifers occur along the South Saskatchewan River and in the northern part of the irrigation project. These aquifers are in fluvial and deltaic deposits (Figs. 1-5).

To better illustrate the origin of the surficial aquifers, five sketches depicting land, water, and ice, as they existed during various phases of glacier retreat, are shown (Figs. 1-5). During Phase 1 (Fig. 1), water flowed through the Denny Spillway into Lake Outlook which in turn drained southward through the South Saskatchewan Spillway into the Qu'Appelle Spillway. Lake Hanley drained through the Blackstrap Spillway. During this phase sand and gravel aquifers presumably formed where streams entered Lake Outlook. During Phase 2 (Fig. 2), Lake Outlook was engulfed by Lake Saskatchewan. As the glacier retreated clays, silts, and sands were deposited in ascending order. Lake Saskatchewan drained through the South Saskatchewan and Blackstrap spillways.

During Phase 3 (Fig. 3), water flowed northward through an ancestrial South Saskatchewan River which eroded the broad valley between Testholes 30 and 39

(Drawing 0117-001-04) before depositing sands and gravels north of Outlook. During this phase, Lake Saskatchewan drained through the Watrous Spillway. Between phases 3 and 4 (Figs. 3,4), the glacier re-advanced to the position shown in Figure 4. This re-advance resulted in about a 50 - foot lake level rise flooding the South Saskatchewan River valley (Fig. 3). During Phase 4 (Fig. 4), clays, silts, and sands in ascending order were deposited in the previously eroded South Saskatchewan River valley and adjacent areas. During this phase, the drainage returned to the Blackstrap Spillway.

During Phase 5 (Fig. 5), the South Saskatchewan River valley was eroded to about 1700 feet. After this phase, the valley was eroded to about 1500 feet before being filled with about 100 feet of alluvial sand.

Sincerely yours,

E.A. Christiansen, P.Eng.

PROFESSIONAL ENGINEER
E.A. Christiansen
SASKATOON
SASKATCHEWAN

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INDEX OF LOGS AND WELLS - OUTLOOK IRRIGATION PROJECT.

Index of Logs and Wells - Outlook Irrigation Project

No.	Name	Location	Well (ft)	Static (ft)	EC (mS/cm)	Cl (ppm)	SAR	Geol.	Lab
1	SSRIP Conquest No. 23	NW14-24-30-09-W3							
2	Silverthorn, D.	SE01-30-30-08-W3	33	20	0.54	5	0.4	D*	SIP**
3		SW03-29-30-08-W3	40					D	
4		NW04-28-30-08-W3	11					D	
5	SIP OK 19	SE04-26-30-08-W3							
6	SIP OK 21	SE03-26-30-08-W3							
7	SIP OK 27	SW01-26-30-08-W3							
8	SIP OK 26	SE04-25-30-08-W3							
9	SIP OK 22	SE02-25-30-08-W3							
10	Larson, H.	NE03-30-30-07-W3	65	10	5.6	739	1.9	D	SIP
11		NE16-30-30-07-W3	18	14				D	
12		SW05-32-30-07-W3	320	120				JR	
13		NE08-32-30-07-W3	276	80				JR	
14	Verwimp, P.	SE16-33-30-07-W3	14	3	2.6	46	1.8	D	SIP
15	FFIB McNichol, M.	SW16-34-30-07-W3	321	100				JR	
16	SRC Broderick	NE16-35-30-07-W3							
17	SWC Koster, W.	NE15-36-30-07-W3	30	6	3.1	42	1.9	D	SIP
17	SWC Koster, W.	NE15-36-30-07-W3	300	85	10.1	5542	61.7	JR	SIP
18		NW13-31-30-06-W3	20	13				D	
19		NE16-31-30-06-W3	34	15				D	
20		NE04-04-31-06-W3	300	+				JR	
21	FFIB Abrahams, E.	NW14-34-30-06-W3	280	60	10.7	5344	62.7	JR	SIP
22	SRC Glenside	NW16-36-30-06-W3							
23		NE32-30-05-W3	28	22				D	
24		NE16-28-30-05-W3	366	30				JR	
25		NE27-30-05-W3	33	14				B	
26		NE25-30-05-W3	444	60				JR	
27	SWC Broderick/SSEWS 84-RH-04	SE02-31-30-04-W3							
28		SE10-28-30-04-W3	195	55				B	
29	SSRIP Conquest No. 49	NW15-12-30-09-W3							
30	SSRID-84-AH-012	NE16-04-30-08-W3							
31	DELETED								
32	SSRID-84-AH-010 (Pz-1)	NE14-03-30-08-W3	26	17.3	0.7	37	0.9	D	
33	SWC Outlook/SSRID-84-RH-02	NE14-03-30-08-W3							

Index of Logs and Wells - Outlook Irrigation Project

No.	Name	Location	Well (ft)	Static (ft)	EC (mS/cm)	Cl (ppm)	SAR	Geol.	Lab
34	DELETED								
35	SSRID-84-AH-042	NW16-03-30-08-W3							
36	SSRID-84-AH-002	NE16-03-30-08-W3							
37	SSRID-84-AH-035	NE14-02-30-08-W3							
38	SSRID-84-AH-033	NE16-02-30-08-W3							
39	SWC Outlook	NW13-06-30-07-W3							
40		SE01-06-30-07-W3	60	10				D	
41		SE16-32-29-07-W3	200					JR	
42	FFIB Kasper, J.	NW13-35-29-07-W3	240	90	4.7	209	44.3	JR	SIP
43	Duncan, W.	NW13-01-30-07-W3	27	13	0.6	5	0.8	D	SIP
44		SW13-30-07-W3	40	15				D	
45	Larson, R.	NW05-24-30-07-W3	245	90	5.7	2002	61.1	JR	SIP
46		SW17-30-06-W3	160					B	
47		SE01-17-30-06-W3	400					JR	
48	FFIB Lee, K.	NW14-10-30-06-W3	30	26				B	
49	Eliason, J.	SW12-11-30-06-W3	65	38	3.5	353	38.1	B	SIP
50		NW14-12-30-06-W3	230	30				B	
51	SWC Broderick/SSEWS-84-RH-03	NW13-07-30-05-W3							
52	SIP Outlook 87-101	SW01-19-30-05-W3							
53		NE16-04-30-05-W3	122	40				B	
54		NE08-03-30-05-W3	38	20				D	
55	Johnson, L.	SE16-02-30-05-W3	358	40	3.7	520	51.7	JR	SIP
56	Johnson, H.	NE07-06-30-04-W3	398	15	3.3	418	52.6	JR	SIP
57	Opdahl, L.	SE02-05-30-04-W3	450	20	3.4	267	41.1	JR	SIP
58	Sander, I.	NE01-04-30-04-W3	320	+6	3.0	283	44.4	JR	SIP
59	SRC Outlook	NE05-18-29-08-W3							
60	DELETED								
61	SDH Outlook	SW03-16-29-08-W3							
62	DELETED								
63	Yavra, J.	NE16-09-29-08-W3	40	20	1.5	20	0.6	D	SIP
64		SW05-15-29-08-W3	65	25				D	
65	Moore, T.	NW13-14-29-08-W3	170	130	1.1	6	2.6	E	SIP
66		NW15-14-29-08-W3	18	15	0.7	18	1.1	D	SIP
67		NW15-13-29-08-W3	25	20				D	

Index of Logs and Wells - Outlook Irrigation Project

No.	Name	Location	Well (ft)	Static (ft)	EC (mS/cm)	Cl (ppm)	SAR	Geol.	Lab
68	Barrich Farm	SW04-19-29-07-W3	293	120	3.8	403	26.2	JR	SIP
69	Follick, B.	NE14-18-29-07-W3	21	15	0.9	16	0.6	D	SIP
70	SWC Outlook/M1-84-RH-01	SE04-16-29-07-W3							
71		SW15-29-07-W3	350	100				B	
72		SW12-14-29-07-W3	30	28				D	
73		NW04-23-29-07-W3	60					D	
74		NW12-23-29-07-W3	119	14	2.6	71	5.0	B	SIP
75	SRC Glenside	NW13-19-29-06-W3							
76	Simonson, D.	NW14-19-29-06-W3	140	10	4.2	129	17.4	B	SIP
77	Hart, L.	NW10-17-29-06-W3	414	55				B	
78		SE01-16-29-06-W3	575	75				B	
79	Martens, V.	SW01-15-29-06-W3	29	12	2	149	1.7	D	SIP
80	Simonson, K.	NW14-12-29-06-W3	50	33	2.5	34	4.8	D	SIP
81		SW02-13-29-06-W3	20	18				D	
82	Overlid, J.	NW03-19-29-05-W3	66	59	2.8	38	7.8	D	SIP
83	FFIB Ringdol, W.	SE03-30-29-05-W3	500	100	3.6	636	45.9	JR	SIP
84		SW20-29-05-W3	490	100				JR	
85		SW15-16-29-05-W3	113	70				D	
86		NE16-22-29-05-W3	31	1				D	
87		NW12-24-29-05-W3	604	70				JR	
88	FFIB Pedersen, N.	SE08-24-29-05-W3	48	12				D	
89	Cooper, G.	NW13-21-29-04-W3	330	20	3.2	390	52.2	B	SIP
90	SWC Conquest/WM1-84-RH-01	SW10-17-28-08-W3							
91	SWC Conquest/WM1-84-RH-04	NE12-16-28-08-W3							
92		NW14-28-08-W3	20	12				D	
93		NE24-28-08-W3	128	48				D	
94	Tomasiewicz, L.	SW08-30-28-07-W3	28	11	1.9	21	1.2	D	SIP
95	SWC Outlook/M1-84-RH-05	SE09-29-28-07-W3							
96	Tomasiewicz, S.	NW05-28-28-07-W3	27	20	2.5	83	1.7	D	SIP
97	SWC Outlook/M1-84-RH-02	SE15-28-28-07-W3							
98	SWC Outlook/M1-84-RH-06	NW13-26-28-07-W3	49	10	6.0	107	20.7	B	SIP
99		SE35-28-07-W3	20	16				D	
100	Vaxick, W.	SW02-36-28-07-W3	20	14	3.4	99	3.9	D	SIP
101		SW12-30-28-06-W3	65	30				D	

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No.	Name	Location	Well (ft)	Static (ft)	EC (mS/cm)	Cl (ppm)	SAR	Geol.	Lab
102		SW08-30-28-06-W3	38	36				D	
103	FFIB Nixon, C.	SW04-27-28-06-W3	590	125				B	
104		NE26-28-06-W3	110	90				D	
105	Simonson, B.	NE03-30-28-05-W3	18	14	1.1	36	0.8	D	SIP
106	FFIB Kallio, M.	NE16-20-28-05-W3	550	180	3.8	861	64.6	JR	SIP
107		SE01-28-28-05-W3	45	36				D	
108		SW03-27-28-05-W3	481	60				JR	
109		NW11-23-28-05-W3	530	150				JR	
110		SW12-24-28-05-W3	600	140	3.6	715	66.9	JR	SIP
111	FFIB Christianson, R.	NW05-07-28-04-W3	600	20?				JR	
112	FFIB Lucki, D.	NW13-08-28-04-W3	580	120	3.4	279	68.0	JR	SIP
113		SW04-16-28-04-W3	459	70				JR	
114	SWC Yahn, S.	SW04-28-27-08-W3	110	63	1.4	18	0.3	B	SIP
115		SW01-28-27-08-W3	70	35				D	
116		SW26-27-08-W3	110	50				B	
117		NW32-27-07-W3	36	8				D	
118	Vester Farms	NE14-33-27-07-W3	20	18	3.2	47	1.5	D	SIP
119		SW01-04-28-07-W3	60						
120	SWC Outlook/M1-84-RH-03	NW04-02-28-07-W3							
121	Peterman, L.	NE16-35-27-07-W3	37	7	0.5	3	0.3	D	SIP
122		SE04-36-27-07-W3	150	90				D	
123		NW11-25-27-07-W3	27	17				D	
124		SW06-30-27-06-W3	14	12				D	
125	Niska, B.	SE09-30-27-06-W3	64	40	3.9	125	2.8	D	SIP
126		SE05-33-27-06-W3	20	12				D	
127		SE12-27-27-06-W3	400	200				?	
128		SE26-27-06-W3	55	35				D	
129	FFIB Norrish & Sons	SW03-25-27-06-W3	469	207	3.8	696	48.9	B	SIP
130		NW16-24-27-06-W3	28	13				D	
131		NW14-19-27-05-W3	40	30				D	
132	SRC Strongfield	SW04-29-27-05-W3							
133	FFIB Tostad, R.	SW02-29-27-05-W3	640	210	3.8	774	54.6	JR	SIP
134	Arthur, A.	NE16-20-27-05-W3	624	200	3.8	828	67.3	JR	SIP
135	Follick	NW14-21-27-05-W3	23	9	0.8	10	0.2	D	SIP

No.	Name	Location	Well (ft)	Static (ft)	EC (mS/cm)	Cl (ppm)	SAR	Geol.	Lab
136	FFIB Birch, J.	NE16-21-27-05-W3	610	187	3.9	800	59.3	JR	SIP
137	FFIB Norrish, D.	SE01-27-27-05-W3	560	205	3.9	703	58.4	JR	SIP
138	DELETED								
139	Jackson, D.	NE13-19-27-04-W3	654	150	4.2	589	62.3	JR	SIP
140		SE08-18-27-04-W3	110	60				D	
141	FFIB Langager, L.	NW15-08-27-04-W3	620	150	4.1	479	66.0	JR	SIP
142	DELETED								
143	DELETED								
144	DELETED								
145	DELETED								
146	DELETED								
147	DELETED								
148	Torvik, O.	NW04-33-27-08-W3	91		1.3	3	0.7	B	SIP
149	Murray, A.	SE16-32-27-08-W3	46	30	6.0	312	3.0	D	SIP
150	Harvey, C.	SE04-04-28-08-W3	48	37	2.5	41	0.5	D	SIP
151	SWC Conquest/WM1-84-RH-02	NW06-04-28-08-W3							
152	SWC Conquest/WM1-84-RH-03	SE12-20-28-08-W3							
153	SWC Conquest/WM1-84-RH-05	NE01-02-29-09-W3							
154		SE19-29-08-W3	200	100				B	
155		SE01-30-29-08-W3	30	25				D	
156	Golder Outlook	NW13-28-29-08-W3	330					JR	
157	Haug, O.	SW13-32-29-08-W3	20	14	0.6	9	0	D	SIP
158	Wilson, S.	SE03-36-30-09-W3	25	19	0.8	18	11.4	D	SRC
159	Tyler, G.	NE08-36-30-09-W3	12	6	0.7	10	5.1	D	SRC
160		SE04-05-31-08-W3	10	8	2.4	46	2.3	D	SIP
161	SSRIP Swanson	SW04-15-31-08-W3	30	20	0.7	5	2.8	D	SRC
162	SRC Cutbank	SE01-06-27-06-W3							
163	DELETED								
164	Hauberg, N.	NW14-12-27-07-W3	60	40	1.9	8	0.7	D	SIP
165	Carlson, A.	SE03-13-27-07-W3	74	18	7.6	342	12.9	D	SIP
166		NE09-14-27-07-W3	40	30				D	
167	SWC Outlook/M1-84-RH-04	NW14-13-27-07-W3							
168	DELETED								
169	DELETED								

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No.	Name	Location	Well (ft)	Static (ft)	EC (mS/cm)	Cl (ppm)	SAR	Geol.	Lab
170	DELETED								
171	DELETED								
172	DELETED								
173	DELETED								
174		NE08-17-28-07-W3	22	18				D	
175		NE17-28-07-W3	210	60				E	
176	Pederson, R.	NE13-17-28-07-W3	24	13	4.2	44	3.8	D	SIP
177		SW20-28-07-W3	35	23				D	
178	DELETED								
179		NE05-31-28-07-W3	37	27				D	
180	Nadeau	NE01-09-29-08-W3	244	60	3.0	5	7.2	JR	SIP
181	SWC Tomecek, J.	NW07-10-29-08-W3	145	70				?	
182	DELETED								
183	DELETED								
184	DELETED								
185	DELETED								
186	DELETED								
187	DELETED								
188	DELETED								
189	DELETED								
190	DELETED								
191	DELETED								
192	DELETED								
193	DELETED								
194	DELETED								
195	DELETED								
196	DELETED								
197	DELETED								
198	Dahl, L.	SE01-21-31-07-W3	22	20	0.9	11	0.6	D	SIP
199	SRC Rabbit Foot Lake	SW04-22-31-07-W3							
200	DELETED								
201	DELETED								
202	DELETED								
203	DELETED								

No.	Name	Location	Well (ft)	Static (ft)	EC (mS/cm)	Cl (ppm)	SAR	Geol.	Lab
204	DELETED								
205	DELETED								
206	Tidewater Dundurn 4	05-01-32-06-W3							
207	FFIB Pettersen, N.	NE15-36-27-05-W3	620	120				JR	
208		SW02-02-28-05-W3	15	5				D	
209		SW03-02-28-05-W3	17	8				D	
210	FFIB Taylor, C.	SE02-04-28-05-W3	640	150	3.7	760	68.8	JR	SIP
211		NW16-32-27-05-W3	195	80				D	
212		SW09-01-28-06-W3	20	17				D	
213		NW16-12-28-06-W3	84					D	
214		SW13-28-06-W3	14	10				D	
215	Mikulcik, C.	NW12-14-28-06-W3	47	30	5.4	123	2.7	D	SIP
216	Rysavy, R.	SE16-02-29-07-W3	98	24	6.6	181	14.5	D	SIP
217		SW13-02-29-07-W3	82	70				D	
218		SE08-10-29-07-W3	145	70					
219		SW16-29-07-W3	28	9				D	
220	SWP Broderick	SE13-15-29-07-W3	28	3	5.7	229	9.9	D	SIP
221		S1/2-03-21-29-07-W3	25					D	
222		SW12-22-29-07-W3	70	40					
223	SIP Outlook 87-108	NW13-26-29-07-W3	22	3	3.8	27	10.7	E	
224		SW34-29-07-W3	222	50				JR	
225		SW01-03-30-07-W3	220	60				JR	
226		NE03-30-07-W3	18	10				D	
227	Kubashek, T.	NW13-03-30-07-W3	22	14	1.0	5	1.1	D	SIP
228		SE05-10-30-07-W3	26	15				D	
229		NW12-10-30-07-W3	14	10				D	
230		SW04-15-30-07-W3	19	16				D	
231		NE08-21-30-07-W3	34					D	
232	Buchmann, K.	NE13-22-30-07-W3	72	20	1.0	34	0.8	D	SIP
233	Carlson, K.	NW04-27-30-07-W3	40	6	1.6	26	1.0	D	SIP
234		NW16-28-30-07-W3	15	11				D	
235		SE34-30-07-W3	24	22				D	
236		SW02-31-07-W3	24	23				D	
237		NW02-31-07-W3	20	19				D	

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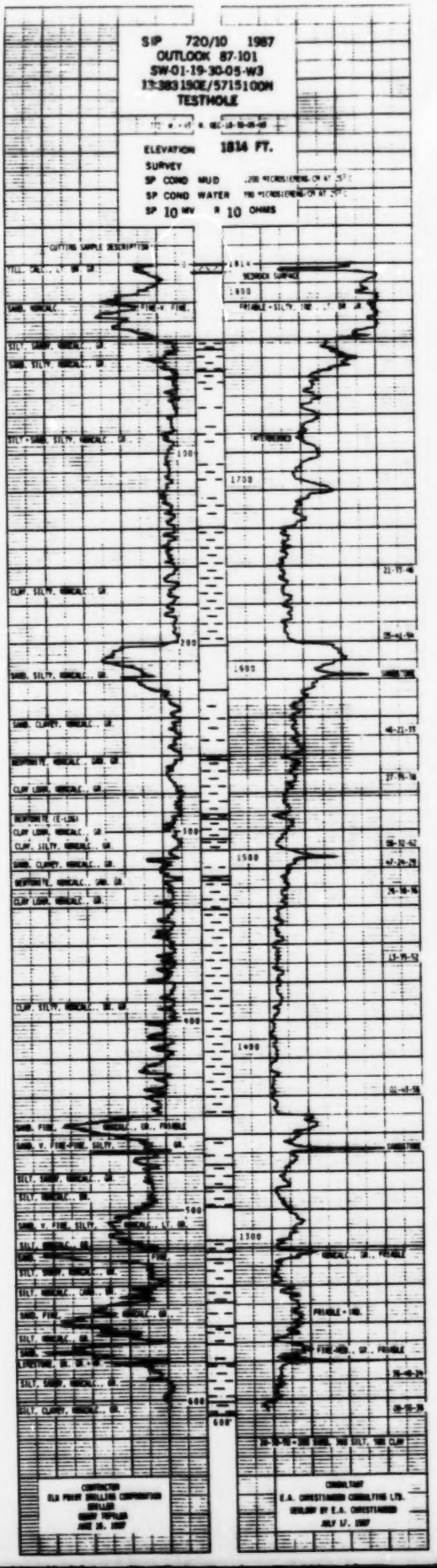
No.	Name	Location	Well (ft)	Static (ft)	EC (mS/cm)	Cl (ppm)	SAR	Geol.	Lab
238		SE10-31-07-W3	18	17				D	
239	Derdall, E.	NW04-14-31-07-W3	20		0.6	8	0.3	D	SIP
240	Dahl, R.	SE12-15-31-07-W3	24	20	0.5	9	0.7	D	SIP
241	DELETED								
242	DELETED								
243	DELETED								
244	DELETED								
245		SW14-14-27-06-W3	16	15				D	
246	FFIB McLean, R.	SE09-26-27-06-W3	400	150				B	
247		NE14-35-27-06-W3	14	12				D	
248		NW02-28-06-W3	42	37				D	
249	Cutting, L.	NW02-09-28-06-W3	20		0.8	4	0.3	D	SIP
250	Solnicka, D.	NE16-08-28-06-W3	20	6	0.5	3	0.4	D	SIP
251	Moir, L.	NE08-17-28-06-W3	115	85	2.4	237	2.7	D	SIP
252		SE08-20-28-06-W3	87	73				D	
253		SE12-28-28-06-W3	64	30				D	
254	Riopka, R.	SE08-32-28-06-W3	390	80	1.1	9	5.5	B	SIP
255	Barber, H.	SW04-04-29-06-W3	22	7	0.7	14	0.6	D	SIP
256	Rankin, Glenside	NW05-04-29-06-W3							
257	Glenside Village	05-05-29-06-W3	400		1.4	16	9	B	SIP
258	SWC Tomecek, W.	NE11-05-29-06-W3	340	50	2.1	32	10.5	B	SIP
259	Macdonald, G.	SE01-07-29-06-W3	340	50	2.7	37	8.1	B	SIP
260	McCullough, W.	NW04-17-29-06-W3	55	40	2.2	19	0.7	D	SIP
261	McPherson, J.	SE12-21-29-06-W3	275	12	4.0	499	42.2	B	SIP
262	FFIB McPherson, R.	SE13-21-29-06-W3	320	24	3.9	536	42.5	B	SIP
263	Martens, P.	NE04-28-29-06-W3	235	50	4.3	572	53.2	B	SIP
264	Tomecek, R.	SE01-32-29-06-W3	258	4	4.1	503	41.8	B	SIP
265		SW05-33-29-06-W3	230	9				B	
266		SE09-32-29-06-W3	24	9				D	
267		SW05-04-30-06-W3	202	+2				B	
268	Morken, G.	SE09-05-30-06-W3	195	+	3.6	485	18.9	B	SIP
269	Eliason, A.	SE08-09-30-06-W3	22	14	1.1	26	0.7	D	SIP
270	Eliason, J.	NW01-15-30-06-W3	35	30	1.0	33	1.3	D	SIP
271		SE09-15-30-06-W3	500	150				JR	

No.	Name	Location	Well (ft)	Static (ft)	EC (mS/cm)	Cl (ppm)	SAR	Geol.	Lab
272		NE08-22-30-06-W3	430	150				JR	
273		NW27-30-06-W3	13	10				D	
274	Burlingame, W.	NW11-03-31-06-W3	40	15	2.4	62	2.5	D	SIP
275		SE10-31-06-W3	22	18				D	
276		NE14-31-06-W3	11	9				D	
277		SE25-31-06-W3	9	7				D	
278	FFIB Fallick, G.	NW05-07-27-04-W3	660	160				JR	
279	FFIB Glubis, L. + R.	NE15-12-27-05-W3	570	165	4.5	656	79.6	JR	SIP
280		NW13-13-27-05-W3	566	140				JR	
281		NW13-24-27-05-W3	60	30				D	
282		SE02-16-28-05-W3	540	160				JR	
283		SW28-28-05-W3	23	16				D	
284		NE16-28-28-05-W3	24	20				D	
285		NW34-28-05-W3	17	10				D	
286		NW05-03-29-05-W3	22	20				D	
287		NE16-04-29-05-W3	18	15				D	
288	TW PLACID Hawarden Cr. 1	12-10-29-05-W3							
289	Pederson, E.	NW01-14-29-05-W3	445	100	3.2	475	58.4	B	SIP
290		SE01-35-29-05-W3	625					JR	
291		SE05-36-29-05-W3	45	10				D	
292		SE03-01-30-05-W3	27	13				D	
293	Haaland, N.	NW15-11-30-05-W3	93		3.6	466	20.9	B	SIP
294	Olson, C.	SW07-14-30-05-W3	42	35	4.5	192	5.7	D	SIP
295	Taralson, M.	NE16-14-30-05-W3	40	22	3.7	142	5.9	D	SIP
296	Knock, W.	NE10-31-30-04-W3	56	35	3.2	77	5.6	B	SIP
297		NW31-30-04-W3	315	6				JR	
298		NE06-31-04-W3	23	15				D	
299	Torguson	SW10-07-31-04-W3	390	+	7.5	2768	50.9	JR	SIP
300	Harder, H.	NE16-18-31-04-W3	315	+	4.0	623	50.8	JR	SIP
301	Torguson	SW03-19-31-04-W3	217	+22	4.3	769	51.9	JR	SIP
302	Kemmer, H.	SW03-30-31-04-W3	207	+6	3.2	68	15.4	JR	SIP
303		NW30-31-04-W3	204					JR	
304		NE01-32-05-W3	267	+				JR	
305		NW08-32-04-W3	295	+				JR	

Index of Logs and Wells - Outlook Irrigation Project

No.	Name	Location	Well (ft)	Static (ft)	EC (mS/cm)	Cl (ppm)	SAR	Geol.	Lab
306	PAN.AM.Pet, Dundurn	14-08-32-04-W3							
307		SW04-16-32-04-W3	235	+30				D	
308	FFIB Wilson, R.	SE08-16-32-04-W3	365	+	2.6	30	2.6	D	SIP
309	FFIB Zacharias, W.	SW12-15-32-04-W3							
310	SIP-OK-29	SW02-30-30-07-W3							
311	DELETED								
312	SIP-OK-33	SE04-15-31-07-W3							
313	SIP-OK-40	NW05-15-31-07-W3							
314	SSRID-84-AH-034	SW03-12-30-08-W3							
315	SRC Rabbit Foot Lake	NE09-21-31-07-W3							
316	Burlingame, W.	NW15-30-31-07-W3	40	22	1.8	35	0.9	D	SIP
317	DELETED								
318	SIP Outlook 87-103	NW16-22-29-08-W3							
319	SIP Outlook 87-104	SW07-15-29-07-W3							
320	SIP Outlook 87-105	SE08-30-28-07-W3							
321	SIP Outlook 87-106	NW12-19-28-07-W3							
322	SIP Outlook 87-109	SW04-03-30-07-W3							
323	SHT Outlook	SW04-16-29-08-W3							
324	Bull, W.	NW01-34-27-07-W3	160	25	0.8	7	0.7	E	SIP
325	DELETED								
326	SIP Outlook 87-115	NE08-07-27-06-W3	271	84	2.1	5	1.5	E	SIP
327	Golder Outlook	NE16-28-29-08-W3	157					E	
328	SSRIP Conquest No. 25	SW02-14-30-09-W3							
329	SSRIP Conquest No. 48	SE03-16-30-09-W3							
330	FFIB Tyler, L.	NE08-17-30-09-W3	315	155				E	
331	SSRIP Conquest No. 10	NE08-19-30-07-W3							
332	SSRIP Conquest No. 51	NE16-25-30-10-W3	* D - Drift		** SIP - Sask. Inst. of Pedology				
333	SSRIP Ardath No. 3	NE09-34-30-10-W3	E - Empress		SRC - Sask. Research Council				
334	SSRIP Ardath No. 4A	NE10-01-31-10-W3	B - Bearpaw		SSTL - Sask. Soil Testing Lab				
335	PFRA C207	SW15-06-27-06-W3	JR - Judith R.						
336	PFRA C553	SE02-07-27-06-W3							
337	SIP Outlook 87-113	NE08-32-30-07-W3							
338	Broderick Marsh Flowing Hole	SW03-18-30-06-W3		+	3.7	340	16.8		SIP

GEOLOGICAL LOGS - OUTLOOK IRRIGATION PROJECT.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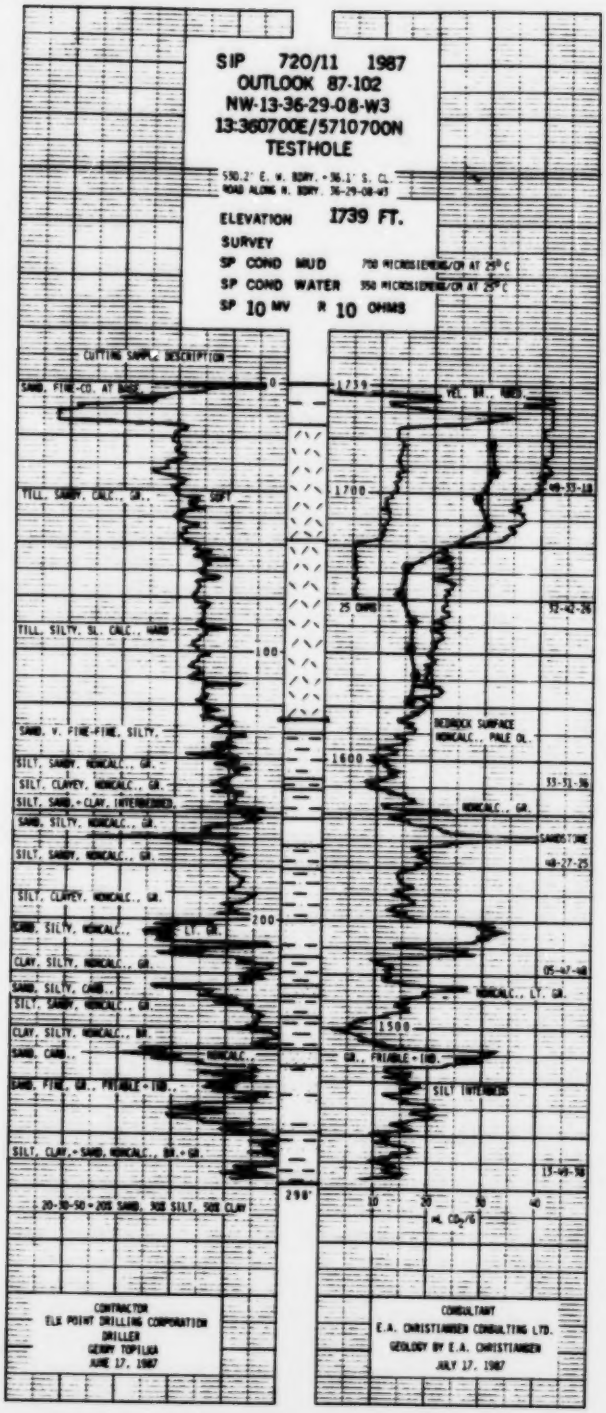
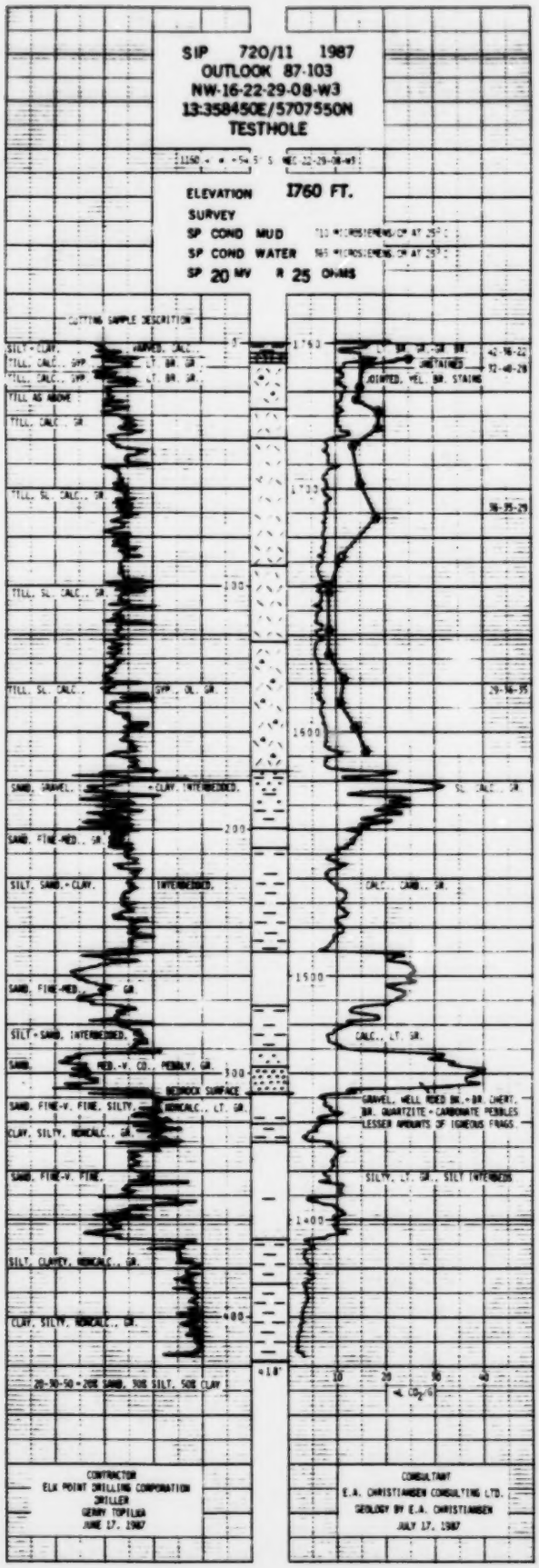
OUTLOOK 87-101
SW-01-19-30-05-W3
13:383190E/5715100N
TESTHOLE
ELEVATION 1814 FT.
SURVEY
SP COND MUD
SP COND WATER
SP 10 MV R 10 OHMS
CUTTING SAMPLE DESCRIPTION
1814
SCHRACK SURFACE
1800
1700
1600
1500
1400
1300
100
200
300
400
500
600
700
CONTRACTOR
ELK POINT DRILLING CORPORATION
DRILLED
JUNE 26, 1987
CONSULTANT
E.A. CHRISTIANSEN CONSULTING LTD.
LOGGED BY E.A. CHRISTIANSEN
JULY 17, 1987


SIP 720/11 1987
OUTLOOK 87-102
NW-13-36-29-08-W3
13:360700E/5710700N
TESTHOLE
ELEVATION 1739 FT.
SURVEY
SP COND MUD
SP COND WATER
SP 10 MV R 10 OHMS
CUTTING SAMPLE DESCRIPTION
1739
1700
1600
1500
100
200
298'
CONTRACTOR
ELK POINT DRILLING CORPORATION
DRILLER
GERRY TOPILKO
JUNE 17, 1987
CONSULTANT
E.A. CHRISTIANSEN CONSULTING LTD.
GEOLOGY BY E.A. CHRISTIANSEN
JULY 17, 1987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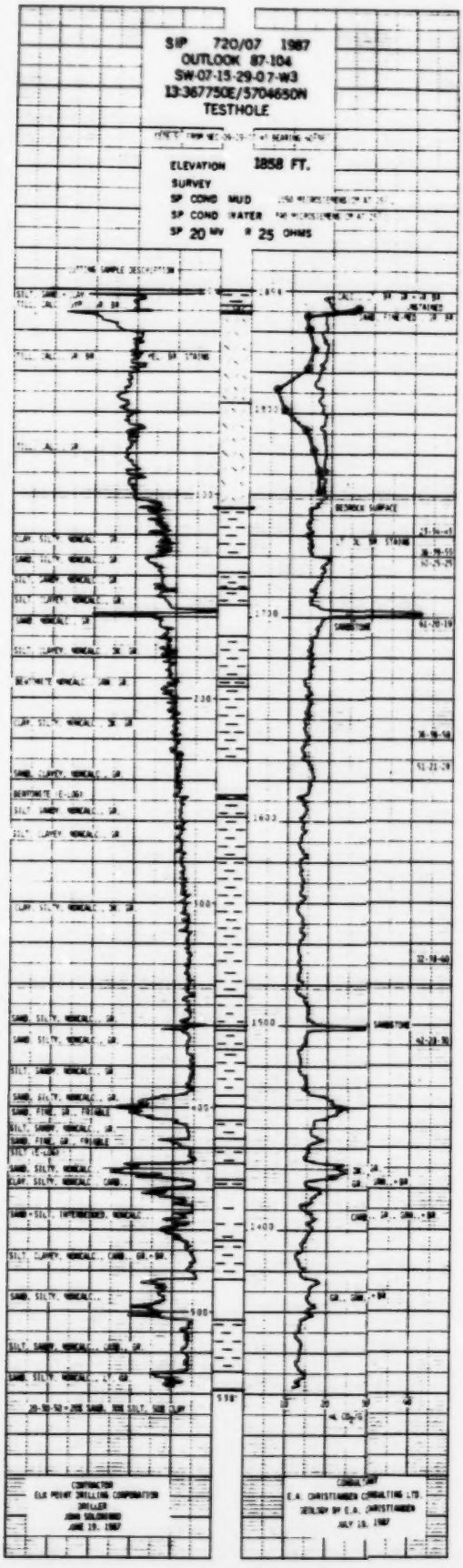
OUTLOOK 87-103
NW-16-22-29-08-W3
13:358450E/5707550N
TESTHOLE
ELEVATION 1760 FT.
SURVEY
SP COND MUD
SP COND WATER
SP 20 MV R 25 OHMS
CUTTING SAMPLE DESCRIPTION
BEDROCK SURFACE
20-30-50-20% SAND, 50% SILT, 50% CLAY
CONTRACTOR
ELK POINT DRILLING CORPORATION
DRILLER
GERRY TOPILKO
JUNE 17, 1987
CONSULTANT
E.A. CHRISTIANSEN CONSULTING LTD.
GEOLOGY BY E.A. CHRISTIANSEN
JULY 17, 1987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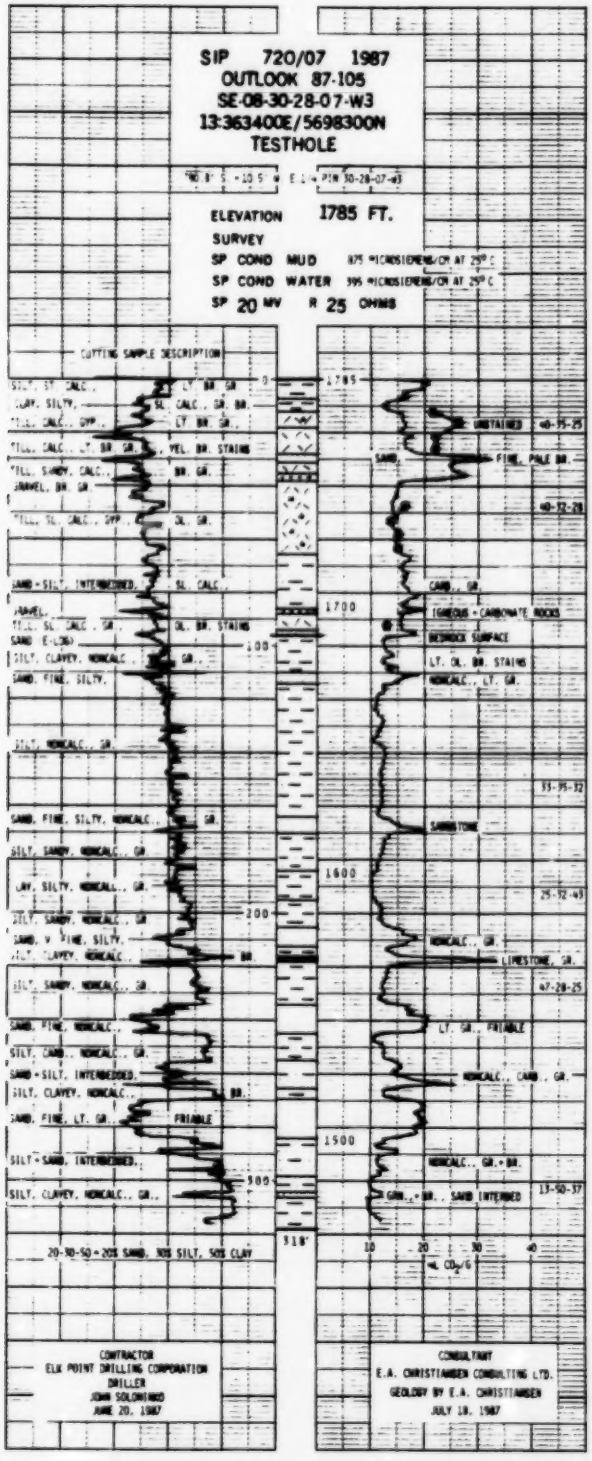
OUTLOOK 87-104
SW-07-15-29-07-W3
13:367750E/5704650N
TESTHOLE
ELEVATION 1858 FT.
SURVEY
SP COND MUD
SP COND WATER
SP 20 MV R 25 OHMS
BEDROCK SURFACE
SANDSTONE
SANDSTONE
1700
1600
1500
1400
500
550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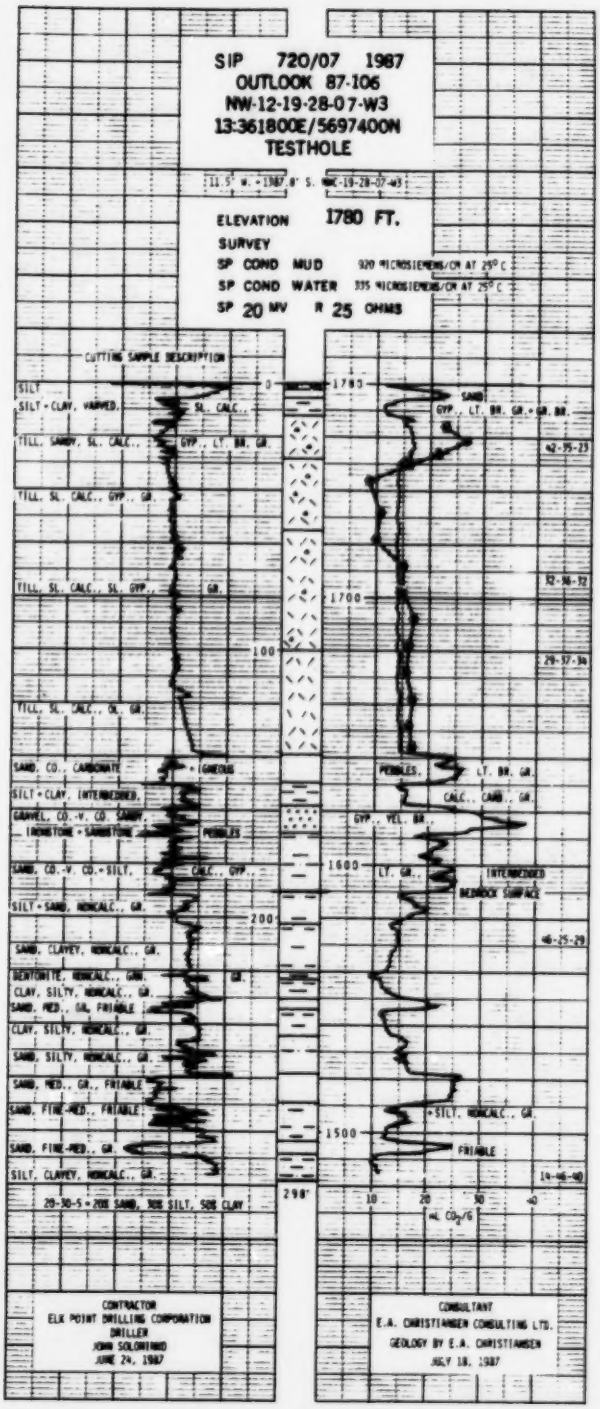
OUTLOOK 87-105
SE-08-30-28-07-W3
13:363400E/5698300N
TESTHOLE
ELEVATION 1785 FT.
SURVEY
SP COND MUD
SP COND WATER
SP 20 MV R 25 OHMS
CUTTING SAMPLE DESCRIPTION
1785
1700
1600
1500
518'
20-30-50 = 20% SAND, 30% SILT, 50% CLAY
CONTRACTOR
ELK POINT DRILLING CORPORATION
DRILLER
JOHN SOLOMUND
JUNE 20, 1987
CONSULTANT
E.A. CHRISTIANSEN CONSULTING LTD.
GEOLOGY BY E.A. CHRISTIANSEN
JULY 10, 1987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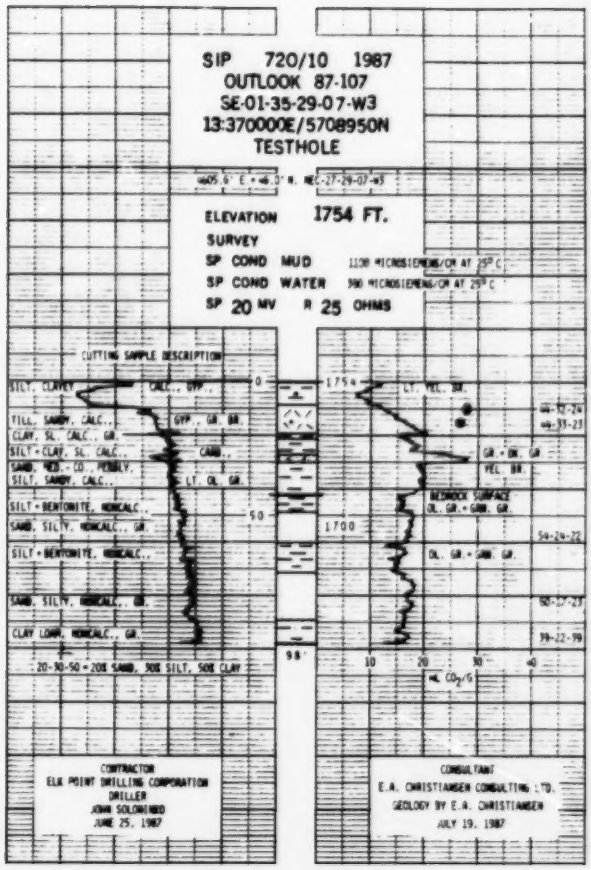
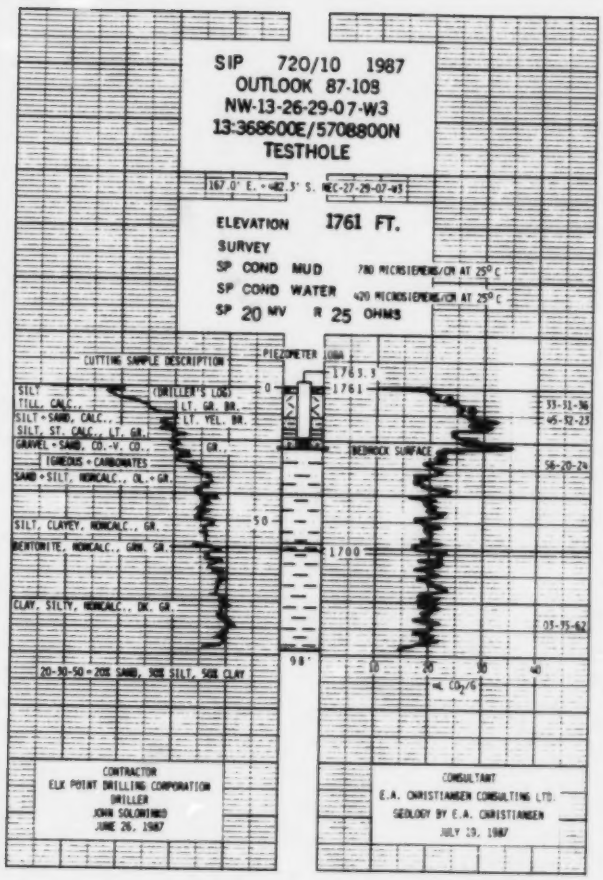
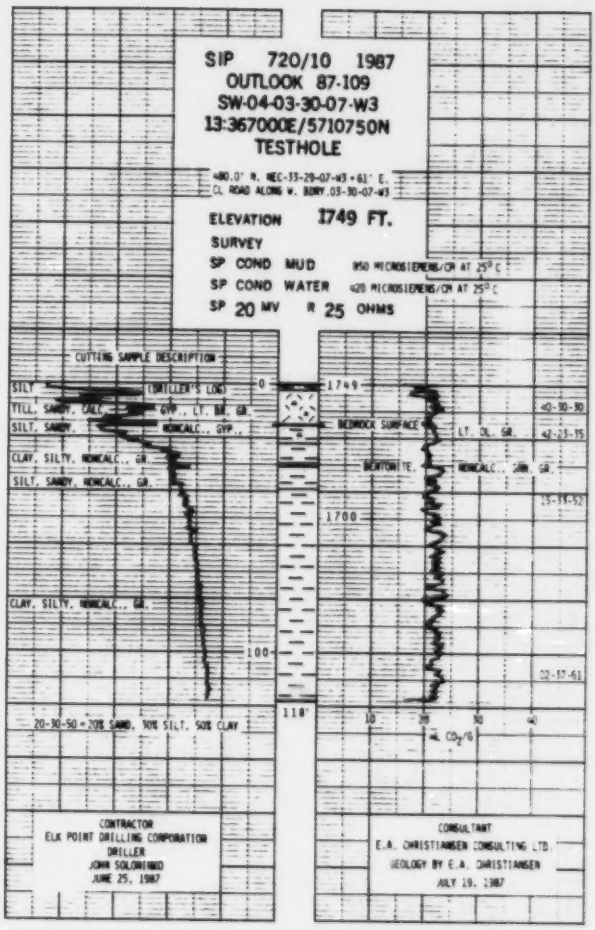
OUTLOOK 87-106
NW-12-19-28-07-W3
13:361800E/5697400N
TESTHOLE
ELEVATION 1780 FT.
SURVEY
SP COND MUD
SP COND WATER
SP 20 MV R 25 OHMS
CUTTING SAMPLE DESCRIPTION
SILT
SILT - CLAY, VARVED, SL. CALC.,
TILL, SANDY, SL. CALC., GYP., LT. BR. GR.
TILL, SL. CALC., GYP., GR.
TILL, SL. CALC., SL. GYP., GR.
TILL, SL. CALC., DK. GR.
SAND, CO., CARBONATE + GNEISS
SILT - CLAY, INTERBEDDED,
GRAVEL, CO.-V. CO. SANDY, LIMESTONE + SANDSTONE PEBBLES
SAND, CO.-V. CO. - SILT, CALC., GYP.
SILT - SAND, NONCALC., GR.
SAND, CLAYEY, NONCALC., GR.
BENTONITE, NONCALC., GRN. GR.
CLAY, SILTY, NONCALC., GR.
SAND, RED., GR., FRIABLE
CLAY, SILTY, NONCALC., GR.
SAND, SILTY, NONCALC., GR.
SAND, RED., GR., FRIABLE
SAND, FINE-RED., FRIABLE
SAND, FINE-RED., GR.
SILT, CLAYEY, NONCALC., GR.
29-30-5-20% SAND, 30% SILT, 50% CLAY
298'
SAND
GYP., LT. BR. GR. + GR. BR.
PEBBLES, LT. BR. GR.
CALC., SAND., GR.
GYP., YEL. BR.
LT. GR.
INTERBEDDED
BEDROCK SURFACE
+ SILT, NONCALC., GR.
FRIABLE
mL CO_2/G
CONTRACTOR
ELK POINT DRILLING CORPORATION
DRILLER
JOHN SOLOMENKO
JUNE 24, 1987
CONSULTANT
E.A. CHRISTIANSEN CONSULTING LTD.
GEOLOGY BY E.A. CHRISTIANSEN
JULY 10, 1987


SIP 720/10 1987
OUTLOOK 87-107
SE-01-35-29-07-W3
13:370000E/5708950N
TESTHOLE
ELEVATION 1754 FT.
SURVEY
SP COND MUD
SP COND WATER
SP 20 MV R 25 OHMS
CUTTING SAMPLE DESCRIPTION
SILT, CLAYEY, CALC., GYP.
TILL, SANDY, CALC.
CLAY, SL. CALC., GR.
SILT + CLAY, SL. CALC.
SAND, MED. - CO., PEBBLY,
SILT, SANDY, CALC.
SILT + BENTONITE, NONCALC.
SAND, SILTY, NONCALC., GR.
SILT + BENTONITE, NONCALC.
SAND, SILTY, NONCALC., GR.
CLAY LOAM, NONCALC., GR.
20-30-50 = 20% SAND, 30% SILT, 50% CLAY
GYP., GR. BR.
CARB.
LT. OL. GR.
0
50
98'
1754
1700
LT. YEL. BR.
YEL. BR.
BEDROCK SURFACE
OL. GR. + GRN. GR.
OL. GR. + GRN. GR.
10
20
30
40
mL CO2/G
CONTRACTOR
ELK POINT DRILLING CORPORATION
DRILLER
JOHN SOLOMUID
JUNE 25, 1987
CONSULTANT
E.A. CHRISTIANSEN CONSULTING LTD.
GEOLOGY BY E.A. CHRISTIANSEN
JULY 19, 1987


SIP 720/10 1987
OUTLOOK 87-109
NW-13-26-29-07-W3
13:368600E/5708800N
TESTHOLE
167.0' E. & 482.5' S. SEC-27-29-07-W3
ELEVATION 1761 FT.
SURVEY
SP COND MUD 780 MICROSIEMENS/CM AT 25° C
SP COND WATER 420 MICROSIEMENS/CM AT 25° C
SP 20 MV R 25 OHMS
CUTTING SAMPLE DESCRIPTION
PIEZOMETER
LOGS
(DRILLER'S LOG)
1763.3
1761
0
SILT
TILL, CALC.,
LT. GR. BR.
SILT + SAND, CALC.,
LT. YEL. BR.
SILT, ST. CALC., LT. GR.
GRAVEL + SAND, CO.-V. CO.,
GR.
IGNEOUS + CARBONATES
BEDROCK SURFACE
SAND + SILT, NONCALC., DL. + GR.
50
SILT, CLAYEY, NONCALC., GR.
BENTONITE, NONCALC., GRN. GR.
1700
CLAY, SILTY, NONCALC., DK. GR.
98'
20-30-50 = 20% SAND, 30% SILT, 50% CLAY
33-31-36
65-32-23
56-20-24
03-75-62
10
20
30
40
mL CO2/G
CONTRACTOR
ELK POINT DRILLING CORPORATION
DRILLER
JOHN SOLOMUND
JUNE 26, 1987
CONSULTANT
E.A. CHRISTIANSEN CONSULTING LTD.
GEOLOGY BY E.A. CHRISTIANSEN
JULY 19, 1987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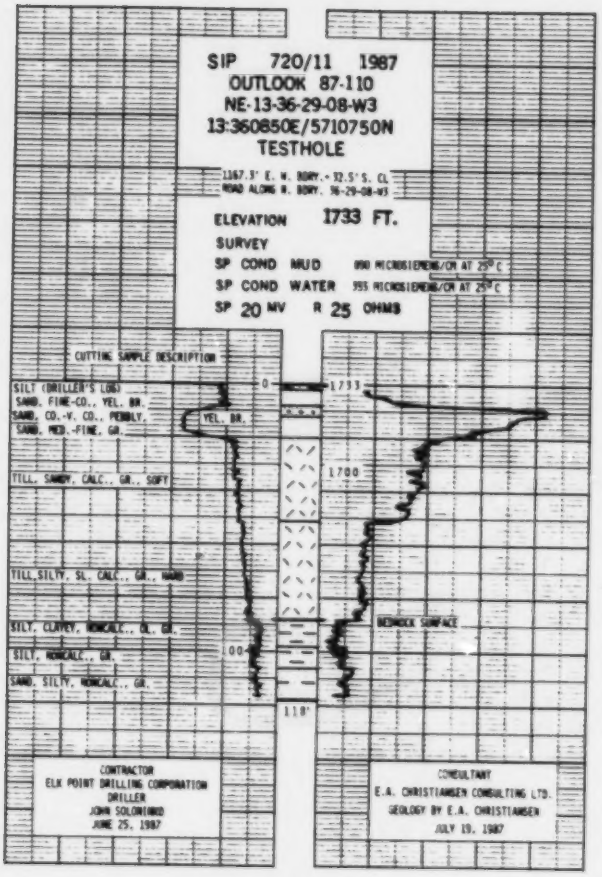
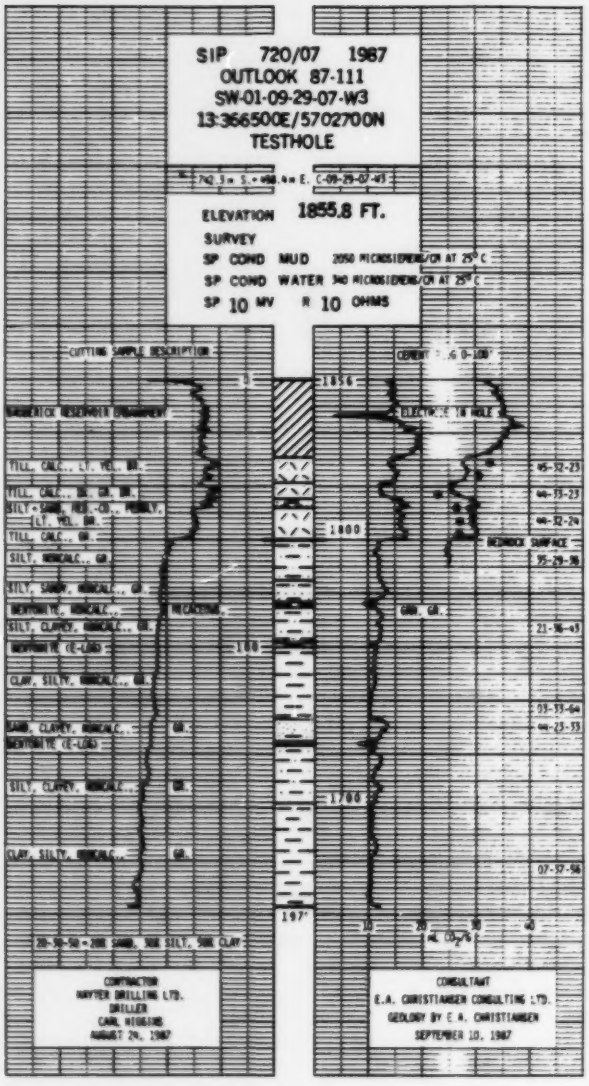
OUTLOOK 87-109
SW-04-03-30-07-W3
13:367000E/5710750N
TESTHOLE
ELEVATION 1749 FT.
SURVEY
SP COND MUD
SP COND WATER
SP 20 MV R 25 OHMS
CUTTING SAMPLE DESCRIPTION
(DRILLER'S LOG)
SILT
TILL, SANDY, CALC.
SILT, SANDY
CLAY, SILTY, NONCALC., GR.
SILT, SANDY, NONCALC., GR.
CLAY, SILTY, NONCALC., GR.
GYP., LT. BR. GR.
NONCALC., GYP.
BEDROCK SURFACE
BENTONITE
LT. OL. GR.
NONCALC., GRN. GR.
1749
1700
100
118'
20-30-50 = 20% SAND, 30% SILT, 50% CLAY
CONTRACTOR
ELK POINT DRILLING CORPORATION
DRILLER
JOHN SOLOMENKO
JUNE 25, 1987
CONSULTANT
E.A. CHRISTIANSEN CONSULTING LTD.
GEOLOGY BY E.A. CHRISTIANSEN
JULY 19, 1987


SIP 720/11 1987
OUTLOOK 87-110
NE-13-36-29-08-W3
13:360850E/5710750N
TESTHOLE
1167.3' E. W. BDRY. - 32.5' S. CL ROAD ALONG R. BDRY. 36-29-08-W3
ELEVATION 1733 FT.
SURVEY
SP COND MUD 990 MICROSIEMENS/CM AT 25° C
SP COND WATER 955 MICROSIEMENS/CM AT 25° C
SP 20 MV R 25 OHMS
CUTTING SAMPLE DESCRIPTION
SILT (DRILLER'S LOG)
SAND, FINE-CO., YEL. BR.
SAND, CO.-V. CO., PEBBLY,
SAND, MED.-FINE, GR.
TILL, SANDY, CALC., GR., SOFT
TILL, SILTY, SL. CALC., GR., HARD
SILTY, CLAYEY, NONCALC., DK. GR.
SILTY, NONCALC., GR.
SAND, SILTY, NONCALC., GR.
YEL. BR.
0
100
110'
1733
1700
BEDROCK SURFACE
CONTRACTOR
ELK POINT DRILLING CORPORATION
DRILLER
JOHN SOLOWIKO
JUNE 25, 1987
CONSULTANT
E.A. CHRISTIANSEN CONSULTING LTD.
GEOLOGY BY E.A. CHRISTIANSEN
JULY 19, 1987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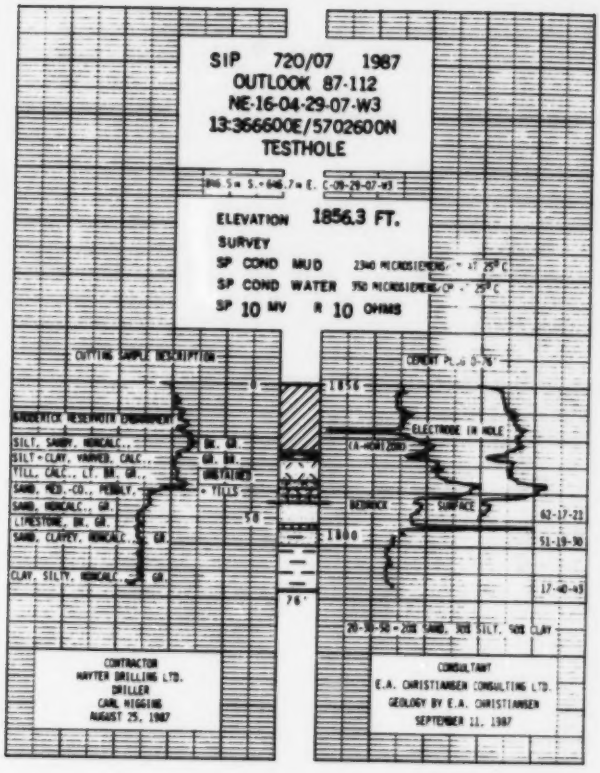
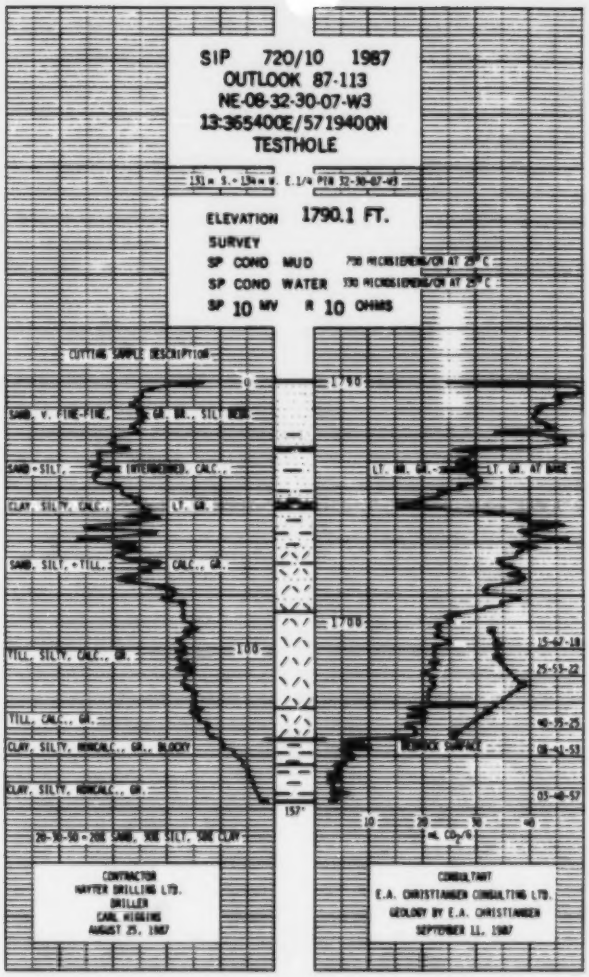
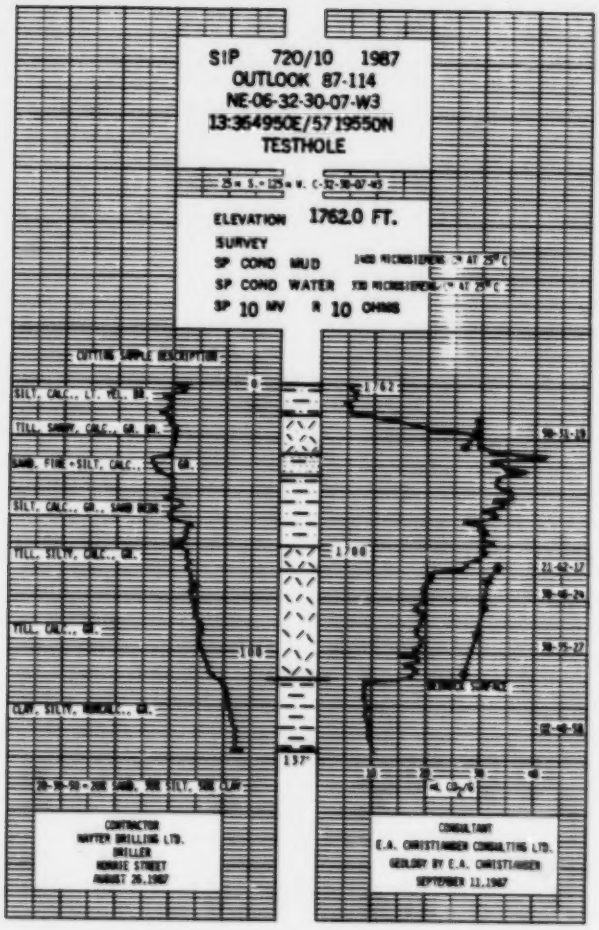
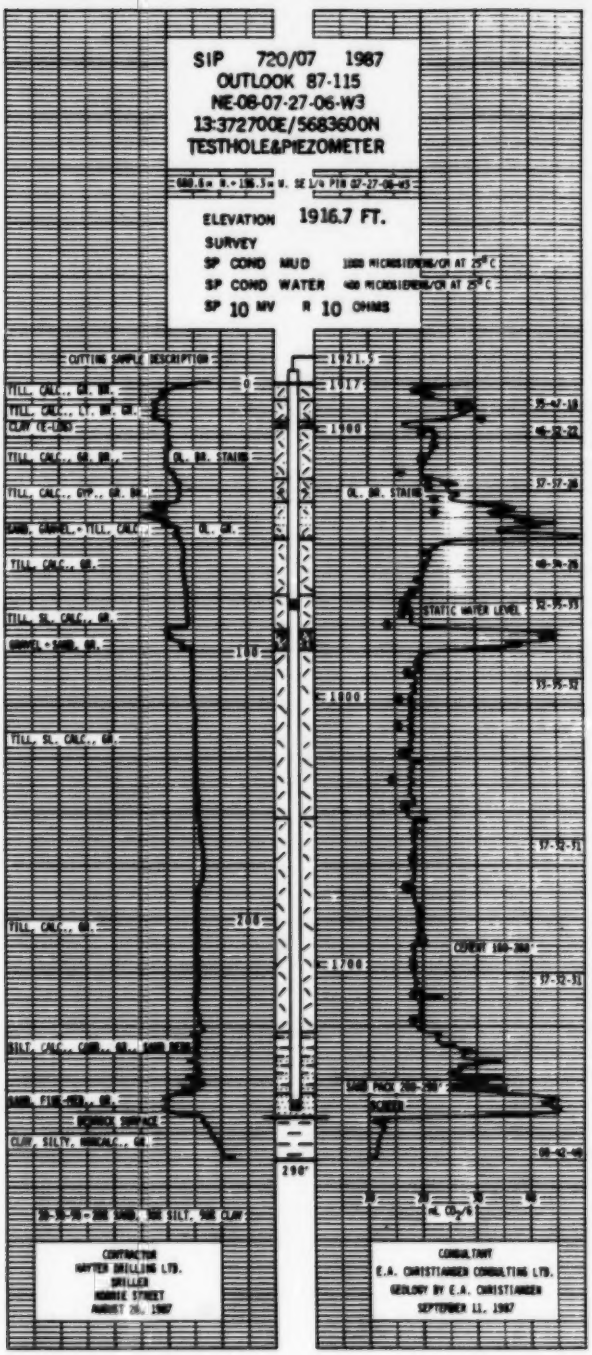
OUTLOOK 87-111
SW-01-09-29-07-W3
13:366500E/5702700N
TESTHOLE
ELEVATION 1855.8 FT.
SURVEY
SP COND MUD 2050 MICROSIEMENS/CM AT 25° C
SP COND WATER 340 MICROSIEMENS/CM AT 25° C
SP 10 MV R 10 OHMS
CUTTING SAMPLE DESCRIPTION
CEMENT : 0-100'
1856
1800
1700
197'
BEDROCK SURFACE
CONTRACTOR
HAYTER DRILLING LTD.
DRILLER
CARL HIGGINS
AUGUST 24, 1987
CONSULTANT
E.A. CHRISTIANSEN CONSULTING LTD.
GEOLOGY BY E.A. CHRISTIANSEN
SEPTEMBER 10, 1987


SIP 720/07 1987
OUTLOOK 87-112
NE-16-04-29-07-W3
13:366600E/5702600N
TESTHOLE
ELEVATION 1856.3 FT.
SURVEY
SP COND MUD
SP COND WATER
SP 10 MV R 10 OHMS
CUTTING SAMPLE DESCRIPTION
CEMENT PLUG 0-76'
ELECTRODE IN HOLE
SURFACE
BEDROCK
1856
1800
50
76'
62-17-21
51-19-30
17-40-43
20-30-50=20% SAND, 30% SILT, 50% CLAY
CONTRACTOR
HAYTER DRILLING LTD.
DRILLER
CARL HIGGINS
AUGUST 25, 1987
CONSULTANT
E.A. CHRISTIANSEN CONSULTING LTD.
GEOLOGY BY E.A. CHRISTIANSEN
SEPTEMBER 11, 1987


SIP 720/10 1987
OUTLOOK 87-113
NE-08-32-30-07-W3
13:365400E/5719400N
TESTHOLE
ELEVATION 1790.1 FT.
SURVEY
SP COND MUD
SP COND WATER
SP 10 MV R 10 OHMS
CUTTING SAMPLE DESCRIPTION
1790
1700
100
157'
BEDROCK SURFACE
CONTRACTOR
HAYTER DRILLING LTD.
DRILLER
CARL HIGGINS
AUGUST 25, 1987
CONSULTANT
E.A. CHRISTIANSEN CONSULTING LTD.
GEOLOGY BY E.A. CHRISTIANSEN
SEPTEMBER 11, 1987


SIP 720/10 1987
OUTLOOK 87-114
NE-06-32-30-07-W3
13:364950E/5719550N
TESTHOLE
ELEVATION 1762.0 FT.
SURVEY
SP COND MUD
SP COND WATER
SP 10 MV R 10 OHMS
CUTTING SAMPLE DESCRIPTION
0
100
137'
1762
1760
BEDROCK SURFACE
CONTRACTOR
WATER DRILLING LTD.
DRILLER
MONROE STREET
AUGUST 26,1987
CONSULTANT
E.A. CHRISTIANSEN CONSULTING LTD.
GEOLOGY BY E.A. CHRISTIANSEN
SEPTEMBER 11,1987


SIP 720/07 1987
OUTLOOK 87-115
NE-08-07-27-06-W3
13:372700E/5683600N
TESTHOLE&PIEZOMETER
ELEVATION 1916.7 FT.
SURVEY
SP COND MUD
SP COND WATER
SP 10 MV R 10 OHMS
CUTTING SAMPLE DESCRIPTION
TILL, CALC., GR. BR.
TILL, CALC., LT. BR. GR.
CLAY (E-LOG)
TILL, CALC., GR. BR.,
TILL, CALC., GYP., GR. BR.
SAND, GRAVEL, TILL, CALC.,
TILL, CALC., GR.
TILL, SL. CALC., GR.
TILL, SL. CALC., GR.
TILL, CALC., GR.
SILT, CALC., GRAD., GR., SAND SEAM
SAND, FINE-MED., GR.
BEDROCK SURFACE
CLAY, SILTY, WEATHER., GR.
CONTRACTOR
HAYTER DRILLING LTD.
DRILLER
ROBBIE STREET
AUGUST 26, 1987
CONSULTANT
E.A. CHRISTIANSEN CONSULTING LTD.
GEOLOGY BY E.A. CHRISTIANSEN
SEPTEMBER 11, 1987

CARBONATE ANALYSES - OUTLOOK IRRIGATION PROJECT.

SASKATCHEWAN SOIL TESTING LABORATORY
Date: 29-06-87 SPECIAL ANALYSIS Page: 1 of 3
SS-LAHENRY#Sa-7328 7373 ***SO4 SO4 - LSS HENRY***

Lab Number	Client Identification	SOIL EQUIV. %
Sa-7328	OTLK 87-102 20-25	30.88
Sa-7329	OTLK 87-102 30-35	30.74
Sa-7330	OTLK 87-102 40-45	28.26
Sa-7331	OTLK 87-102 50-55	30.03
Sa-7332	OTLK 87-102 65-70	15.70
Sa-7333	OTLK 87-102 75-80	14.27
Sa-7334	OTLK 87-102 85-90	16.13
Sa-7335	OTLK 87-102 95-100	15.76
Sa-7336	OTLK 87-102 105-110	17.05
Sa-7337	OTLK 87-102 115-120	15.76
Sa-7338	OTLK 87-103 4.0	25.02
Sa-7339	OTLK 87-103 7.5	15.57
Sa-7340	OTLK 87-103 15-20	15.20
Sa-7341	OTLK 87-103 20-25	14.64
Sa-7342	OTLK 87-103 25-30	19.26
Sa-7343	OTLK 87-103 30-35	18.91
Sa-7344	OTLK 87-103 40-45	13.72
Sa-7345	OTLK 87-103 55-60	15.20
Sa-7346	OTLK 87-103 70-75	18.35
Sa-7347	OTLK 87-103 85-90	10.44
Sa-7348	OTLK 87-103 100-105	9.17
Sa-7349	OTLK 87-103 115-120	9.08
Sa-7350	OTLK 87-103 125-130	9.27
Sa-7351	OTLK 87-103 135-140	11.12
Sa-7352	OTLK 87-103 145-150	10.57

Comment:

SASKATCHEWAN SOIL TESTING LABORATORY
Date: 89-06-07 SPECIAL ANALYSIS Page: 2 of 3
SS-L.REPORT456-7328/7378 ***SOIL SCI. - LES HENRY***

Lab Number	Client Identification	CEC EQUIV. meq/gm
S6-7353	OTLK 87-103 155-160	13.90
S6-7354	OTLK 87-103 165-170	15.72
S6-7355	OTLK 87-104 0-5	13.35
S6-7356	OTLK 87-104 5-10	25.45
S6-7357	OTLK 87-104 10-15	13.72
S6-7358	OTLK 87-104 15-20	14.42
S6-7359	OTLK 87-104 25-30	15.39
S6-7360	OTLK 87-104 35-40	14.27
S6-7361	OTLK 87-104 45-50	8.49
S6-7362	OTLK 87-104 55-60	8.34
S6-7363	OTLK 87-104 65-70	13.90
S6-7364	OTLK 87-104 75-80	15.20
S6-7365	OTLK 87-104 85-90	16.50
S6-7366	OTLK 87-104 95-100	16.87
S6-7367	OTLK 87-104 105-110	14.83
S6-7368	OTLK 87-105 10-15	21.13
S6-7369	OTLK 87-105 15-20	26.14
S6-7370	OTLK 87-105 20-25	22.43
S6-7371	OTLK 87-105 30-35	22.06
S6-7372	OTLK 87-105 40-45	20.20
S6-7373	OTLK 87-105 45-50	16.31
S6-7374	OTLK 87-105 50-55	14.27
S6-7375	OTLK 87-105 55-60	15.20
S6-7376	OTLK 87-105 60-65	14.83
S6-7377	OTLK 87-105 65-70	16.13

Comment:

SASKATCHEWAN SOIL TESTING LABORATORY

Date: 29-Oct-87 SPECIAL ANALYSIS Page: 1 of 1

SS-L.HENRY*S6-7329/7378 ***SO4 SC. - LES HENRY***

Lab Number	Client Identification	CO3 EQUIV meq/gm
S6-7378	OTLK 87-105 95-100	13.1s

Comment:

End

Lot Number	Client Identification	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

SASKATCHEWAN SOIL TESTING LABORATORY

Date: 11-09-87
SPECIAL ANALYSIS
LES HENRY*S7-0926/0975
SO. SC. - LES HENRY

Lab Number	Client Identification	CO2 EQUIV. kg/ha
S7-0926	87-OK-115 5-10	26.88
S7-0927	87-OK-115 10-15	31.33
S7-0928	87-OK-115 15-20	20.02
S7-0929	87-OK-115 20-25	22.24
S7-0930	87-OK-115 25-30	20.02
S7-0931	87-OK-115 30-35	15.94
S7-0932	87-OK-115 35-40	21.50
S7-0933	87-OK-115 40-45	22.43
S7-0934	87-OK-115 45-50	22.24
S7-0935	87-OK-115 60-65	20.39
S7-0936	87-OK-115 65-70	20.20
S7-0937	87-OK-115 70-75	19.83
S7-0938	87-OK-115 75-80	18.17
S7-0939	87-OK-115 80-85	16.50
S7-0940	87-OK-115 85-90	15.94
S7-0941	87-OK-115 90-95	13.90
S7-0942	87-OK-115 105-110	17.61
S7-0943	87-OK-115 115-120	15.39
S7-0944	87-OK-115 125-130	15.39
S7-0945	87-OK-115 135-140	16.13
S7-0946	87-OK-115 145-150	14.83
S7-0947	87-OK-115 155-160	16.50
S7-0948	87-OK-115 165-170	18.35
S7-0949	87-OK-115 175-180	18.54
S7-0950	87-OK-115 185-190	16.87

Comment:

SASKATCHEWAN SOIL TESTING LABORATORY

Date: 11-09-87 SPECIAL ANALYSIS

$LES HENRY*S7-0926/0975 ***SO. SC. - LES HENRY***

Lab Number	Client Identification	CO2 EQUIV. ml/gm
S7-0951	87-OK-115 195-200	19.65
S7-0952	87-OK-115 205-210	20.02
S7-0953	87-OK-115 215-220	18.17
S7-0954	87-OK-115 225-230	18.17
S7-0955	87-OK-115 235-240	18.17
S7-0956	87-OK-114 10-15	29.84
S7-0957	87-OK-114 15-20	28.92
S7-0958	87-OK-114 20-25	26.69
S7-0959	87-OK-114 65-70	33.18
S7-0960	87-OK-114 70-75	30.77
S7-0961	87-OK-114 80-85	30.40
S7-0962	87-OK-114 90-95	29.66
S7-0963	87-OK-114 105-110	26.88
S7-0964	87-OK-113 90-95	32.81
S7-0965	87-OK-113 95-100	34.11
S7-0966	87-OK-113 100-105	34.11
S7-0967	87-OK-113 110-115	38.93
S7-0968	87-OK-113 120-125	32.07
S7-0969	87-OK-113 130-135	25.77
S7-0970	87-OK-111 30-35	32.62
S7-0971	87-OK-111 35-40	30.21
S7-0972	87-OK-111 40-45	22.80
S7-0973	87-OK-111 45-50	26.32
S7-0974	87-OK-111 50-55	27.06
S7-0975	87-OK-111 55-60	27.06

Comment:

End

MECHANICAL ANALYSES - OUTLOOK IRRIGATION PROJECT.

Date: 29-06-87
SS-L.HENRY*S6-7379/7395

SASKATCHEWAN SOIL TESTING LABORATORY
MECHANICAL ANALYSIS
SO. SC. - LEE HENRY

Lab Number	Client Identification	Sand percent	Silt percent	Clay percent
S6-7379	OTLK 87-102 35-40	49.4	32.9	17.8
S6-7380	OTLK 87-102 80-85	31.8	41.6	26.6
S6-7381	OTLK 87-102 145-150	32.9	30.7	36.4
S6-7382	OTLK 87-102 180-185	48.2	27.0	24.8
S6-7383	OTLK 87-102 215-220	5.4	47.1	47.5
S6-7384	OTLK 87-102 290-295	12.5	49.0	38.4
S6-7385	OTLK 87-103 6.0	42.2	35.4	22.4
S6-7386	OTLK 87-103 7.5	32.2	39.6	28.2
S6-7387	OTLK 87-103 140-145	29.7	35.8	35.6
S6-7388	OTLK 87-103 65-70	36.2	34.8	29.0
S6-7389	OTLK 87-104 115-120	23.2	33.7	43.1
S6-7390	OTLK 87-105 150-155	32.8	34.7	32.5
S6-7391	OTLK 87-105 190-195	25.0	32.1	42.9
S6-7392	OTLK 87-105 225-230	46.8	28.0	25.2
S6-7393	OTLK 87-105 300-305	13.2	49.8	36.9
S6-7394	OTLK 87-105 10-15	40.2	34.8	25.0
S6-7395	OTLK 87-105 45-50	39.9	31.8	28.3

Comment:

End

Lab Number	Client Identification	Sand	Silt	Clay
87-1018	OUTLOOK 87-101 160-165	20.7	32.9	46.4
87-1019	OUTLOOK 87-101 170-180	8.2	43.7	48.1
87-1020	OUTLOOK 87-101 245-250	45.9	21.8	32.3
87-1021	OUTLOOK 87-101 270-275	21.7	39.9	38.3
87-1022	OUTLOOK 87-101 305-310	5.9	31.9	62.2
87-1023	OUTLOOK 87-101 315-320	46.9	24.2	28.9
87-1024	OUTLOOK 87-101 330-335	21.1	33.6	45.3
87-1025	OUTLOOK 87-101 365-370	12.8	35.0	52.3
87-1026	OUTLOOK 87-101 435-440	1.3	43.9	55.8
87-1027	OUTLOOK 87-101 505-510	36.4	41.2	22.4
87-1028	OUTLOOK 87-101 615-620	3.2	58.1	38.7
87-1029	OUTLOOK 87-104 125-130	5.7	39.3	55.0
87-1030	OUTLOOK 87-104 130-135	45.9	24.9	29.2
87-1031	OUTLOOK 87-104 160-165	41.3	37.2	21.5
87-1032	OUTLOOK 87-104 210-220	5.3	36.5	57.8
87-1033	OUTLOOK 87-104 230-235	50.7	21.3	28.2
87-1034	OUTLOOK 87-104 325-330	2.4	37.5	60.2
87-1035	OUTLOOK 87-104 365-370	42.2	27.9	29.9
87-1036	OUTLOOK 87-106 20-25	42.6	34.7	22.7
87-1037	OUTLOOK 87-106 70-75	31.9	36.2	31.9
87-1038	OUTLOOK 87-106 100-105	27.3	39.8	33.9
87-1039	OUTLOOK 87-106 215-220	46.1	25.4	28.5
87-1040	OUTLOOK 87-106 290-300	14.3	46.2	39.5
87-1041	OUTLOOK 87-107 5-10	44.0	32.4	23.6
87-1042	OUTLOOK 87-107 10-15	44.3	32.7	23.0

Comments:

Date: 14-07-87

Lab Number	Client Identification	[illegible]	[illegible]	[illegible]
87-1128	OUTLOOK 87-107 55-60	21.1	28.9	22.1
87-1067	OUTLOOK 87-107 10-15	21.1	17.1	22.5
87-1130	OUTLOOK 87-107 75-110	26.1	22.1	27.1
87-1031	OUTLOOK 87-103 0-5	21.1	18.7	30.3
87-1032	OUTLOOK 87-103 5-10	45.3	21.6	23.1
87-1033	OUTLOOK 87-103 25-30	55.5	20.9	24.1
87-1034	OUTLOOK 87-103 35-40	1.1	29.8	42.1
87-1035	OUTLOOK 87-109 5-10	49.1	30.1	20.9
87-1036	OUTLOOK 87-107 15-20	51.5	21.7	26.8
87-1037	OUTLOOK 87-109 40-45	15.1	33.1	51.7
87-1038	OUTLOOK 87-109 105-110	1.1	17.9	81.1

Insert.

End

SASKATCHEWAN SOIL TESTING LABORATORY

Date: 11-09-87 MECHANICAL ANALYSIS

$LES HENRY*S7-0976/1005 xxxSO. SC. - LES HENRYxxx

Lab Number	Client Identification	Sand percent	Silt percent	Clay percent
S7-0976	87-OK-115 5-10	35.1	47.0	17.9
S7-0977	87-OK-115 15-20	46.1	31.6	22.4
S7-0978	87-OK-115 35-40	37.3	36.8	25.9
S7-0979	87-OK-115 65-70	39.7	33.8	26.5
S7-0980	87-OK-115 80-85	31.7	35.0	33.3
S7-0981	87-OK-115 110-115	32.6	35.5	31.9
S7-0982	87-OK-115 170-175	36.7	32.5	30.8
S7-0983	87-OK-115 220-225	36.9	32.4	30.7
S7-0984	87-OK-115 285-290	8.7	41.9	49.4
S7-0985	87-OK-112 45-50	61.7	17.5	20.7
S7-0986	87-OK-112 55-60	50.8	18.9	30.2
S7-0987	87-OK-112 75-80	16.9	39.8	43.3
S7-0988	87-OK-114 15-20	49.6	30.8	19.6
S7-0989	87-OK-114 65-70	20.9	62.4	16.7
S7-0990	87-OK-114 75-80	30.1	45.5	24.4
S7-0991	87-OK-114 95-100	38.1	35.4	26.6
S7-0992	87-OK-114 125-130	2.6	39.7	57.6
S7-0993	87-OK-113 95-100	14.5	67.4	18.1
S7-0994	87-OK-113 105-110	24.9	53.1	22.0
S7-0995	87-OK-113 125-130	40.0	35.1	24.9
S7-0996	87-OK-113 135-140	6.0	41.4	52.5
S7-0997	87-OK-113 155-160	3.2	39.9	56.8
S7-0998	87-OK-111 30-35	44.9	32.2	22.9
S7-0999	87-OK-111 40-45	43.6	32.9	23.5
S7-1000	87-OK-111 50-55	44.0	31.8	24.2

Comment:

SASKATCHEWAN SOIL TESTING LABORATORY

Date. 11-09-87 MECHANICAL ANALYSIS

¶LES HENRY¤S7-0976/1005 ¤¤¤SO. SC. - LES HENRY¤¤¤

Lab Number	Client Identification	Sand percent	Silt percent	Clay percent
S7-1001	87-OK-111 65-70	35.5	28.6	36.0
S7-1002	87-OK-111 90-95	21.1	36.1	42.8
S7-1003	87-OK-111 120-125	2.8	32.7	64.5
S7-1004	87-OK-111 128-131	43.7	23.3	33.0
S7-1005	87-OK-111 180-185	6.9	37.4	55.7

Comment:

¤¤¤End¤¤¤

MAPS
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OMISES